REMARKS

This amendment is being filed in response to the Advisory Action mailed July 29, 2004. The Examiner states that Applicants admitted prior art "discloses separate gamma correction units," while Kobayshi is cited "to teach independent reference voltage data for each color". Applicants do not agree.

Kobayshi teaches that "a reference voltage control circuit 100 outputs, instead of an input image signal during the blanking period of the input image signal, reference voltage level generated in accordance with addition of a brightness control signal to each sub-brightness control signal, and outputs, during an effective display period of the input image signal, the input image signal" (Claim 8). Each sub-brightness control signal is set separately for each of a red image signal, a green image signal, and a blue image signal. In detail, reference voltage data (CDR, CDG and CDB) is supplied to the first input of the selectors 111r, 111g, 111b, and the RGB image data (DR, DG, DB) is supplied to the second input of the selectors 111r, 111g, 111b (Fig. 8). The digital RGB image data (DR, DG, DB) and reference voltage data (CDR, CDG and CDB) are alternatively output. During the effective display period, the digital RGB image data (DR, DG and DB) is output, and during the blanking period, the reference voltage data (CDR, CDG and CDB) is output (col. 6, lines 26-33).

A clamping circuit 35 clamps the reference voltage level of the analog RGB signal in accordance with a clamping pulse CLP (Fig. 6(b) and Fig. 7(b)), which is turned on only within the blanking period of the RGB image signals, so that the DC component is regenerated (every blanking period) (col. 4, lines 49-53). By varying the reference voltage in accordance with the brightness level, a DC component of a voltage signal, obtained by clamping the reference

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

voltage, is controlled so that each color can be adjusted to an optimum brightness level between white level VW and black level VB in Fig. 6(c) and Fig. 7(c).

As described above, the reference voltage control circuit 100 of Kobayashi supplies reference voltage data CD (CDR, CDG and CDB) for R, G and B color to the clamping circuit 35. However, in the claims of the instant application, a driving circuit has a reference voltage generating circuit for supplying respectively reference voltages to said first gamma compensating circuit, said second gamma compensating circuit and said third gamma compensating circuit.

Also, in Kobayashi, a clamping circuit 35 clamps the reference voltage level of the analog RGB signal (an arbitrary DC component in level) based on a brightness control signal and each sub-brightness control signal, which is turned on only within the blanking period of the RGB image signals. However, the driving circuit as claimed in the instant application comprises the steps of applying respectively, independent gamma compensations to a red video signal (including non-DC component), a green video signal (including non-DC component) and a blue video signal (including non-DC component), by supplying respectively, independently generated reference voltages to each of a plurality of gamma compensating circuits.

Furthermore, in Kobayashi, the LCD module comprises the signal processor circuit 1 for performing brightness and contrast control (inputted arbitrarily by an operator) on the input RGB digital data and for performing gamma correction (determined by a level of an input image signal), (col. 4, lines 22-24). As is apparent from the above, Kobayshi recognizes a difference in brightness control and gamma correction in operation and effect. Therefore, it is an object of Kobayashi's device to achieve an optimum brightness, not to achieve an optimum gamma compensation, which is the object of the present invention. An optimum brightness

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

level is achieved by controlling a brightness obtained by RGB additive color process, even when controlling a brightness for every R, G and B color (not controlling respectively independently brightness for every R, G and B color).

Furthermore, in Kobayashi, when controlling a brightness for every R, G and B color, reference voltage data CD (CDR, CDG and CDB) for R, G and B color are generated by adding a common brightness data BD and a sub-brightness data SB (SBR, SBG and SBB) for every R, G and B color. Thus, each color can be adjusted to an optimum brightness level. Therefore, in Kobayashi, each color is adjusted to an optimum brightness level. However, in the present invention, it is possible to achieve optimum gamma compensations suitable to the characteristics of a color liquid crystal display by applying respectively independently gamma compensations for every R, G and B color without relating to each other in voltage.

Finally, in Kobayashi, the amplitude of each of the image signals to be displayed on the screen is not varied or controlled, during the effective display period, even when a reference voltage as a DC component is varied or controlled to achieve an optimum brightness level during the blanking period.

In contrast, in the present invention, the amplitude of each of the video signals to be displayed on the screen is varied or controlled by supplying a respectively independently generated reference voltage (being not a DC component) to achieve a optimum gamma compensation during the effective display period. However, a DC component of the compensation video signal, outputted from each clamp circuit (2_1, 2_2, 2_3) in Fig. 1, is not varied or controlled, during the blanking period as well as during the effective display period.

Kobayashi does not supply the missing teaching to Applicants' APA to render obvious Applicants' gamma compensation circuit.

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
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FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

Kobayashi teaches a reference voltage control signal 100 that functions as a brightness controller to output either RGB image data (DR, DG, DB) or reference voltage data (CDR, CRG, and CDB) (col. 6, lines 10-33). Nowhere does Kobayshi teach a gamma compensation circuit that performs independent compensation for a red signal, a green signal and a blue signal, as required by Applicants' claims. Nor does Kobayshi teach a gamma compensation circuit that performs gamma compensation based upon transmitted characteristics that only apply to the respective red, green and blue signals, as required by Applicants' claims.

Thus, Kobayshi cannot achieve or render obvious claims 1, 3-4, 9 and 11-12.

Having dealt with all the issues raised in the Examiner's Advisory Action, the Application is now believed to be in condition for allowance. Early and favorable action are respectfully requested.

In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account Number 08-1391.

Respectfully submitted,

Norman P. Soloway

Norman P. Soloway
Attorney for Applicants
Reg. No. 24,315

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I hereby certify that this correspondence is being sent via facsimile to EXAMINER Tom V. Sheng of the United States Patent and Trademark Office at facsimile number (703) 872-9306, on November 23, 2004 from Tucson, Arizona.

By Kim Hood

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

NPS/ALK:sb